7.18 CUMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) Regulations For Implementing NEPA (40 Code of Federal Regualtions [CFR] 1500) defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions." The CEQ Regulations further state that "cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." In the case of the potential revision of the water control plan for the Missouri River, a major action will be taking place. Similar actions of this magnitude would be changes in operations on major river systems such as the Upper Mississippi River, the Tennessee River, and the Ohio River. Determination of the cumulative impacts of any combination of changes on the Lower Mississippi River would be extremely complex and well beyond the scope of this Study. Effects of changing only the Missouri River Mainstem Reservoir System water control plan on the Middle and Lower Mississippi Rivers are addressed in this RDEIS (see Section 7.15).

In lieu of addressing the cumulative impacts of water control operational changes across a major part of the United States, another type of discussion follows. Three types of information will be summarized. First, the complexity of selecting a water control plan for the Mainstem Reservoir System will be discussed. Second, some users within the system and along the Lower River are very sensitive to changes in operations, and a synopsis of how these users tend to view the Corps' ability to meet their needs is discussed. Finally, some examples are presented of the factors several sample projects in some stage of planning or construction at this time should consider as these projects move toward implementation.

7.18.1 Complexities in Selecting a Water Control Plan and Need for Awareness of Water Level Changes

A revision of the Mainstem Reservoir System Water Control Plan is a major undertaking in terms of the amount of time and effort taken to get to the point of preparing this RDEIS. Many individuals within and outside of the Missouri River basin would support the contention that this is probably the most important decision that will be made regarding water resources in the basin. This support is based on the breadth of the geographical area of the potential impacts and the potential severity of the impacts to a small segment of the environmental resources or economic uses relying on the river.

This RDEIS presents a cumulative impact assessment of the combined effects of many past, present, and foreseeable future actions in the Missouri River basin in general, and along the river, specifically. The results of these past and present actions are identified in Chapter 3. The current conditions in the basin serve as the baseline for the impacts presented in Chapters 5 (of submitted alternatives) and 7 (of alternatives selected for detailed analysis).

As an example of cumulative impacts of past, present, and foreseeable actions, the RDEIS addresses the amount of available habitat for three endangered species: the least tern, piping plover, and pallid sturgeon. Available habitat for all three species has diminished from historic levels. Construction of the Mainstem Reservoir System and downstream bank stabilization and navigation projects, the operation of the system over the past 30 plus years (60 plus years for Fort Peck Dam and Lake), and the continuing operation under the CWCP have all contributed to this loss. Impacts to the habitat as described in this chapter are based on the amount of habitat that was available at various times in the 1990s, which is a reflection of the past and present (at that time) actions. The amount of habitat will fluctuate as the flows and lake levels respond to the future operation of the system. Continued operation of the system under the Water Control Plan that is ultimately implemented will be the major factor that will continue to affect the amount of habitat for these species. For this reason, the USFWS included changes in how the Water Control Plan addresses releases from Fort Peck and Gavins Point Dams. The Water Control Plan changes included as part of the BiOp RPA are recommended to ensure that needed habitat is available for these three species. The effects of four plans (four GP options) that the Corps feels address the November 2000 USFWS BiOp RPA flow recommendations on the habitat for these species are discussed in several sections of Chapter 7 (7.3, 7.6, 7.7, 7.15, 7.16, 7.17, 7.19, 7.20, and 7.21). Flow changes alone are not adequate for the pallid sturgeon. Additional shallow water habitat is currently being constructed or formed naturally as

the result of floods. Considerably more habitat will have to be constructed to meet minimal needs, as identified in the BiOp.

Section 7.17 identifies the economic uses and environmental resources that could be adversely affected under the six potential Water Control Plans addressed in this chapter. Adverse impacts could continue to occur under the CWCP, and the only way to quantify the future changes is to look at past trends. Adaptive management has always been a part of the CWCP, and changes to the CWCP continue to evolve to some extent as adaptive management requirements continue to fit within the discretionary authority of the Corps. The baseline for all impacts in each Master Manual EIS has always been the CWCP; therefore, Table 7.17-1 presents the relative impacts of the MCP and the GP options compared to the CWCP. Review of this table shows that highlighted (greater than a 1 percent change) adverse impacts occur in up to three economic use categories and three environmental resource categories. These adverse affects are anticipated to occur if the Water Control Plan is ultimately revised to reflect the MCP or one of the GP options. There is nothing in the foreseeable future that could significantly limit or eliminate any of these impacts other than to continue to operate under the CWCP or select an alternative Water Control Plan not included in Chapter 7. For example, Table 5.17-1 shows that the highlighted negative groundwater, navigation, and riparian habitat impacts could be removed from the highlighted adversely affected list by operating under the MRBA alternative. Adverse impacts greater than those currently occurring under the CWCP would occur to warmwater river fish habitat, historic properties, and interior drainage under the MRBA alternative. Even though this alternative would limit adverse impacts, it was dropped from further consideration as a complete plan because it did not include any immediate measures to address the needs of the three listed species.

Need for Awareness of Water Level Changes

As the 1987 to 1993 drought began, many individuals expressed concerns regarding negative impacts to different economic uses. Corps staff readily recognized that many decisions with adverse economic consequences had been made without fully considering that the status quo that existed since the system first filled in 1967 could change. In some cases, some of those individuals adversely affected were not aware that the declining lake levels and river flows could occur, and others made decisions knowing that they were taking some economic risks. In either case, it became readily apparent to the Corps and many individuals that none of the project purposes could be served in the same manner they had been over the previous 20 years of full system operation.

Even after the 1987 to 1993 drought (the first major drought since the system first filled and became fully operational in 1967), some users dependent on the lakes and river to meet their needs did not take appropriate action to protect themselves from future drought impacts. They could have undertaken measures to alleviate or eliminate adverse effects; however, they elected not to. The Corps continued to make it clear to some users that it could not adequately serve all users in droughts. For example, the Nearman Creek Power Station, owned and operated by the Board of Public Utilities (BPU), Kansas City, Kansas, had to shut down for several days in late 2000 when the Corps reduced winter releases because of drought. Major increases in the Gavins Point releases would have been required to allow continued operation of this powerplant that winter. The shutdown continued until BPU could implement temporary measures to pump enough water to allow full powerplant production. No measures were taken to assure continued access to the river at lower stages after the 1987 to 1993 drought, or after the 1993 flood on the Missouri River caused considerable degradation through the Kansas City reach. In its comments on the DEIS, the BPU indicated that it would have problems operating in another drought under the winter drought releases required under the CWCP. Although BPU knew as early as 1994 (letter dated October 3, 1994) that they would have problems in droughts, BPU did not have any temporary or permanent structural measures in place by December 2000 to preclude water access problems when another drought started in 2000. BPU suffered a significant economic loss before the temporary measures were in place and the plant again became fully operational.

Representatives for Midwest Power, the utility in Iowa that operates the Port Neal Station south of Sioux City, met with Corps staff in late 2000. They were concerned that the low winter releases would adversely affect the operations of the power units. They indicated that they were in the initial stages of planning, designing, and building a new intake to

serve the powerplant at a cost in the neighborhood of $40 million. The need to build the new intake became more imminent when additional degradation of the riverbed in the Sioux City reach occurred during the much higher than normal flows in 1997, a record runoff year for the Mainstem Reservoir System and basin draining into the river above Sioux City. Minor increases in releases above those planned were made to allow this facility to remain fully operable. Construction of the new intake will need to accommodate future degradation in the reach and the cutback in releases to meet a water supply target along the Lower River as low as 9 kcfs in droughts. All of the alternatives being considered at this time have similar low-flow criteria as part of their drought conservation measures. The summer low-flow releases from Gavins Point Dam in all of the alternatives evaluated in Chapter 7 should have no adverse impact on the ability of the future intake to pull water from the river if it is properly designed.

UPDATE: As the RDEIS was being proofed before reproduction, the Master Manual staff found that Midwest Power decided to stop actions leaning towards construction of a new intake. This decision was based on the potential that all powerplants are going to have to use cooling towers to dissipate water heat in the future. Water to meet powerplant needs would be greatly reduced, eliminating the need for the currently planned intake. Unfortunately, this measure could be costly should the current drought persist and flows be reduced to 9 kcfs in the Sioux City reach.

Some users cannot make changes and have to be able to financially manage the bad years with the good years. For example, some farmers raise crops on marginal lands, and they can successfully make a profit in some years such that they will continue to take the risks to farm the marginal areas. Similarly, some individuals invested funds in recreation-related facilities that were significantly adversely affected during the 1987 to 1993 drought. These individuals began to worry and likely suffered financially when another drought started in 2000. When a succession of "bad" years comes, these users' attention naturally goes toward the Corps to determine what the Corps is doing wrong as it operates the system. When they discover that the Corps is following the Water Control Plan specified in the Master Manual, in this case, the CWCP, they determine the plan is wrong and should be changed to minimize their impacts. The Corps has the discretion to make some changes from historic operations under the CWCP; however, it must continue to serve the project purposes Congress required it to meet as part of the authorization of the Mainstem Reservoir System and other downstream projects on the Lower River. Some changes do not fall within this discretionary authority and require a revision of the Water Control Plan in the Master Manual, which requires that certain procedures be followed. This is not an easy accomplishment based on the current effort to review and potentially revise the Master Manual.

When the review and comment period for the RDEIS is over in February 2002, a difficult decision will need to be made by the Corps if implementation is to occur as part of the 2003 Mainstem Reservoir System operations under the Annual Operating Plan for that year. Many factors will be considered, including the November 2000 USFWS BiOp, comments made during the RDEIS review and comment period, and dialogue the Corps has with the public, river users, and other entities (the Tribes, States, other Federal agencies, MRBA, MRNRC, ACT, etc.).

Once the decision is made, future changes under the adaptive management process may be required as the Corps continues to work with the USFWS through the ACT, and with basin stakeholders through some form of participation that may be integrated into the ACT effort. Adaptive management is required because uncertainties currently exist regarding the potential needs of the three listed species specifically addressed by the BiOp RPA. The science is not completely known; therefore, the needs are not fully understood. Future monitoring and analysis will better define the science and, subsequently, the needs of these species.

Some say that the spring rise and the lower summer flows are a move toward providing flows on the Lower River that mimic the historic hydrograph and a move toward total ecosystem management. At this point in time, the Corps views the spring rise and lower summer releases from Gavins Point as being provided primarily for specific needs of the least terns, piping plovers, and pallid sturgeon. Based on the data presented in this RDEIS, the spring rise does not provide island building for the terns and plovers (see Section 7.2). This type of geomorphic change occurs in years with the higher volumes of water that must be moved in a single year (such as 1975, 1997, etc.). The prescribed spring rise may not even be of sufficient magnitude or duration to adequately scour vegetation off of the sandbars and islands. It also does not significantly

improve connectivity to floodplain lands along the river (see Section 7.7.6). The primary reason for implementation of a spring rise at this time is to provide a spawning cue; however, very little is currently known about the pallid sturgeon's specific spawning cue requirements (see Section 7.7.8). Lower summer flows are required to maximize the amount of relatively clear sandbar habitat (see Section 7.6), and the lower the summer flow, the greater the amount of habitat for the least tern and piping plover (and potential fledge ratios and populations). The USFWS also recommended these same lower summer flows to increase shallow water habitat for the pallid sturgeon during its fragile larval stage; however, the increases in habitat provided by the reduction in flows is minimal compared to identified pallid sturgeon acreage of shallow water habitat needs (see Section 7.7.7). In summary, the Gavins Point release changes required for the species are primarily to provide a spawning cue for the pallid sturgeon (spring rise) and increase habitat for terns and plovers (lower summer flows). The effectiveness of any of the GP options in accomplishing these two requirements is not completely known at this time, and monitoring and analysis of the data will provide insight as to the effectiveness of the selected Water Control Plan. The uncertainty of actually meeting these needs makes plan selection of one of the GP options difficult. Plan selection is difficult knowing that the spring rise adversely impacts crop production along the Lower River (see Sections 5.8.2, 5.8.3, 7.8.2, and 7.8.3) and the lowest summer flows may eliminate commercial navigation from the river (see Section 7.12), adversely affect Lower River (and Fort Randall downstream reach) recreation (see Section 7.11), and decrease hydropower revenues, which will potentially result in higher costs to the consumers of this electricity (see Section 7.10).

7.18.2 Projects Currently Being Considered

Many projects or facilities within the basin are in some phase of planning, design, or construction, that may, in some way, be dependent on the Mainstem Reservoir System lake levels, on river reach flows, or on the flows moving through the Lower River. In many cases, lake levels and flows provide considerable benefits to those using the facilities directly or to the outputs from those projects or facilities. As these projects or facilities move closer to construction and implementation, considerations must be made of the variability that can occur under the wide variety of conditions the system operates under on a day-by-day, month-by-month, and year-by-year basis. No Water Control Plan can optimally meet any users or resources needs, but the adverse impacts can be minimized with some appropriate planning and implementation actions. The remainder of this cumulative impacts section will identify several projects and activities that are almost completed or will be making significant advances toward completion over the next few years. These projects are just a sample of the projects being planned or implemented and are not intended to be all inclusive. Suggestions for considerations that should be taken into account are identified to help minimize adverse impacts from system operations. There is no set order for these projects, activities, etc. The general recommendations for each of the projects listed should be considered representative and applied to similar projects at an appropriate scale.

The City of Omaha is in the process of making decisions regarding is municipal dock. Development in the downtown area has required that a new dock be located upstream several miles at the Industrial Park north of Eppley Airfield. Currently, the cost is estimated to be as much as $7 million. If the Water Control Plan continues to be the CWCP or is changed to the MCP, this facility would likely be as functional in most years as the existing dock is under the CWCP. If the selected plan is either the GP1528 option or the GP2028 option, the facility would likely be functional. One must, however, consider that at least one towing company has indicated that it may not be able to continue to stay in business with minimum navigation service being provided from mid-June to September 1 in many summers. If the selected plan is either the GP2021 option or the GP1521 option, the likelihood that navigation would cease on the Missouri River increases considerably. In many years, commodities could not be moved through the Municipal Dock if the only mode of transportation it serves is barges. This discussion points out the need to build navigation facilities that can operate using more than barges as the mode of transporting commodities.

The need to move the City of Omaha dock is the result of efforts up and down the Lower River to reconnect with the river. Omaha riverfront development has escalated in recent years. The upcoming Lewis and Clark Bicentennial

Commemoration is one factor leading to this recent escalation for some communities. Direct access to the river may be a big part of the plans of these communities as they conduct these "back to the river" efforts. Access to and from the river will be a major requirement during the Commemoration and into the future as this river reconnection continues. Access may be a problem under some, if not all of the alternatives, and keeping the access facilities open will require some dredging under all of the alternatives, with the amount and cost of dredging potentially increasing as the summer low flows decrease. This same dredging requirement applies to all recreational navigation facilities and users along the Lower River.

Another form of recreational navigation use recently began operations on the river in the Omaha area. River Barge Excursion is a venture that previously provided river excursions on the Mississippi, Ohio, and Cumberland Rivers. In 1999 it began operations on the Missouri River. The company is based in New Orleans, and a considerable investment in the tens of millions of dollars has been made. The excursion vessel, the River Explorer, which is made up of two barges and a towboat. The barges have a draft of 5.5 to 6 feet, and the towboat, the MISS NARI, drafts 8.5 feet, which will require full navigation service flows to operate on the Missouri River in most years. In 2001 the River Explorer made four trips on the Missouri River between St. Louis and Kansas City. Also, it made a trip this year as far upstream as Bellevue, Nebraska, located just south of Omaha. Plans are underway to make a trip all of the way to Sioux City in 2002, with a goal of developing a market for passengers for the upcoming Lewis and Clark Bicentennial Commemoration. Under any of the alternatives addressed in Chapter 7, persistence of the current drought could adversely affect these plans. Under the CWCP, navigation service was 3 kcfs less than full service this year. If the drought persists, navigation service could drop to minimum service. Under the MCP, storage in the system would require the same service level as was provided under the CWCP this year in all years until the drought is over, unless an extremely dry upper basin results in no storage gain between the March 15 and July 1 service level checks. If this were to occur, navigation service would drop to minimum service for the remainder of that season and likely through much of the next year up to about the end of August. Under the GP options with minimum service flows in all years (unless flood storage evacuation requires movement of extra water in the summer), minimum service would be nearly an annual occurrence. Similarly, there would be no navigation service under the other two GP options with the 25/21-kcfs split during the summer. All of the GP options could basically eliminate the Missouri River as a source of business for this venture.

A recent announcement was made by the Winnebago Tribe to launch a ferry service between the Reservation lands in northeastern Nebraska to lands on the Reservation across the river in Iowa, where the Tribe operates a casino. The ferry would provide a more direct access from homes in Nebraska to the casino for the Tribal members working there and customers. It would also provide a more direct access to Interstate 29 in Iowa, which would open up additional job opportunities for Tribal members. An estimated 800,000 vehicles on one-way trips are forecasted to use this ferry on an annual basis at a cost of $3 to $5 per vehicle for a round trip. This ferry is expected to have a draft of 2 to 2.6 feet, and the terminals on either side of the river would be designed for river fluctuations ranging from the lower water levels in the winter months to a 100-year flood event level. Based on these parameters, this undertaking should be able to operate successfully under any of the alternatives addressed in Chapter 7; however, the harbor for the east river terminal may require additional dredging support during the 25/21-kcfs split-season of the GP1521 and GP2021 options.

Similar to actions in the planning stage in Omaha, the St. Joseph Port Authority initiated construction of a new port on August 31, 2001 at a cost of about $1 million. This facility is anticipated to give businesses in St. Joseph a competitive advantage because shipping and receiving by barge is known to be the most cost-effective alternative for the bulk movement of commodities. Negotiations are to be finalized shortly with Global Materials Services LLC to operate the port. Operation of this facility could be dramatically affected, depending on which alternative is selected as the Water Control Plan for the Master Manual. Under the CWCP and the MCP, no long-term problems obtaining service from towing companies are anticipated. Problems begin to surface on an annual basis with the two GP options with minimum navigation service releases each summer. A high likelihood that there is no summer service, and maybe no service at all, occurs for the two GP options with the 25/21-kcfs summer split releases from Gavins Point Dam. If either of the two latter alternatives becomes the selected

Water Control Plan, accommodations for other modes of transportation may be required at this facility to allow it to continue to operate. Plans are currently underway in St. Joseph to develop its waterfront to complement the new port facility. This effort may face problems depending on how successful the new port is able to meet the development's needs.

The Corps is currently nearing the completion of the construction of numerous fish and wildlife habitat sites as mitigation for the loss of this habitat to the Missouri River Bank Stabilization and Navigation Project from Sioux City to the mouth of the river. Additional mitigation has been authorized; however, Congress has not yet authorized the required funding. If funding is authorized and appropriated, the Corps will continue to construct fish and wildlife habitat. How the funds are used has not yet been fully determined; however, there will be considerable pressure to use much of it to construct aquatic habitat meeting the shallow water habitat recommendations specified by the USFWS in its BiOp. These sites will need to be constructed with some flexibility relative to meeting the requirements of the pallid sturgeon because adaptive management may change river flows. Summer river stages could be approximately 1 to 1.5 feet different for an adaptive management switch from the CWCP to a Water Control Plan with minimum navigation service releases during the summer. The difference increases to approximately 2 to over 3 feet for a change to a plan with a 25/21-kcfs split (see page 10 of the Summary for the RDEIS).

All four of the GP options adversely affect hydropower revenues as this power is marketed by WAPA in the region. The summer minimum service options have an $8 to $9 million average annual adverse impact, and the 25/21-kcfs flow options have about a $30 million average annual adverse impact (see Section 7.10). Replacement of the hydropower generating units is currently occurring at Garrison Dam, and plans are in various stages of consideration and planning for units at Fort Randall and Gavins Point Dams. The replacement units are more efficient than the existing units; therefore, more electricity will be generated with the same amount of water moving through the units. This may help offset some of the adverse economic effects of the GP options. It may also offset some of the potential adverse impacts lower summer flows may have on the generating capability from powerplants along the Lower River (see Section 7.10).